



BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

PRODUCT: TSM-DEG21C.20

POWER RANGE: 645-665W

665W

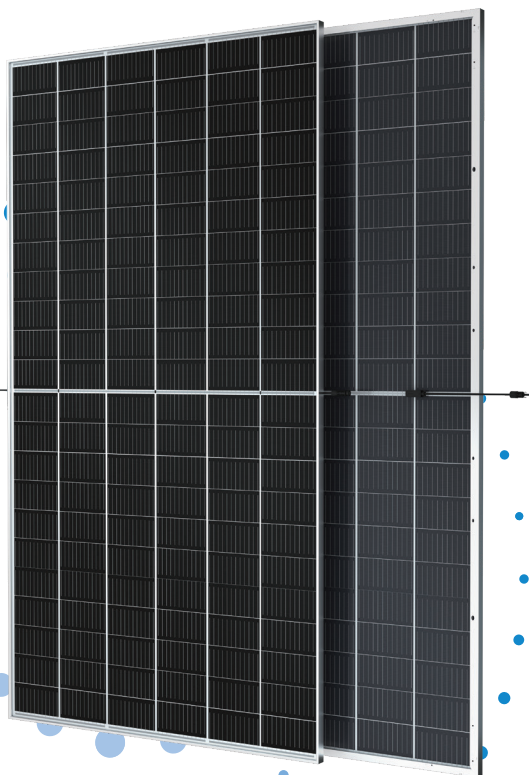
MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.4%

MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components



High power up to 665W

- Up to 21.4% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



High reliability

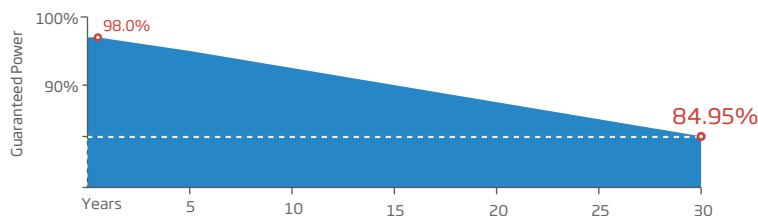
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo

Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



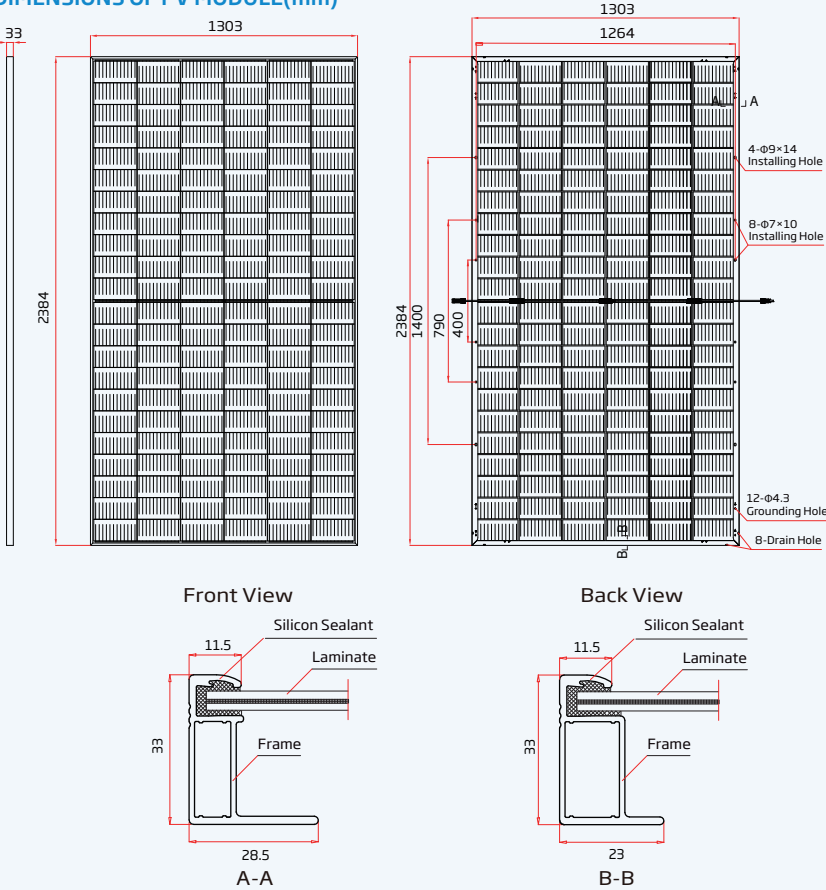
Comprehensive Products and System Certificates



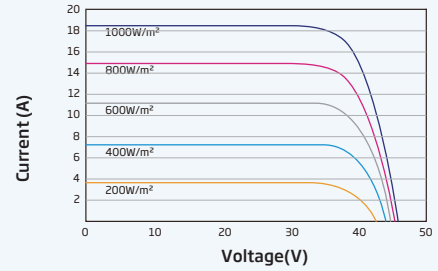
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



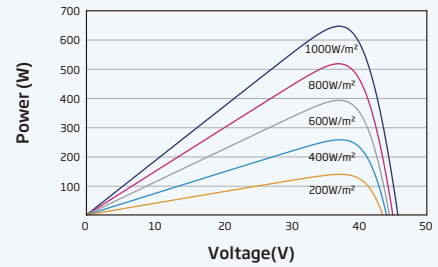
DIMENSIONS OF PV MODULE(mm)



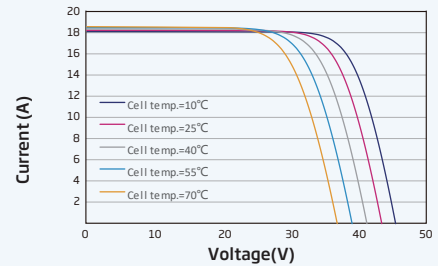
I-V CURVES OF PV MODULE(650 W)



P-V CURVES OF PV MODULE(650W)



I-V CURVES OF PV MODULE(650 W)



ELECTRICAL DATA (STC)

| | | | | | |
|---------------------------------------|--------|-------|-------|-------|-------|
| Peak Power Watts - P_{MAX} (Wp)* | 645 | 650 | 655 | 660 | 665 |
| Power Tolerance- P_{MAX} (W) | 0 ~ +5 | | | | |
| Maximum Power Voltage - V_{MPP} (V) | 37.5 | 37.7 | 37.9 | 38.1 | 38.3 |
| Maximum Power Current - I_{MPP} (A) | 17.23 | 17.27 | 17.31 | 17.35 | 17.39 |
| Open Circuit Voltage - V_{OC} (V) | 45.3 | 45.5 | 45.7 | 45.9 | 46.1 |
| Short Circuit Current - I_{SC} (A) | 18.31 | 18.35 | 18.40 | 18.45 | 18.50 |
| Module Efficiency η_m (%) | 20.8 | 20.9 | 21.1 | 21.2 | 21.4 |

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 10% Irradiance ratio)

| | | | | | |
|---|-------|-------|-------|-------|-------|
| Total Equivalent power - P_{MAX} (Wp) | 690 | 696 | 701 | 706 | 712 |
| Maximum Power Voltage - V_{MPP} (V) | 37.5 | 37.7 | 37.9 | 38.1 | 38.3 |
| Maximum Power Current - I_{MPP} (A) | 18.44 | 18.48 | 18.52 | 18.56 | 18.60 |
| Open Circuit Voltage - V_{OC} (V) | 45.3 | 45.5 | 45.7 | 45.9 | 46.1 |
| Short Circuit Current - I_{SC} (A) | 19.59 | 19.63 | 19.69 | 19.74 | 19.79 |
| Irradiance ratio (rear/front) | 10% | | | | |

Power Bifaciality: 70±5%.

ELECTRICAL DATA (NOCT)

| | | | | | |
|---------------------------------------|-------|-------|-------|-------|-------|
| Maximum Power - P_{MAX} (Wp) | 488 | 492 | 495 | 499 | 504 |
| Maximum Power Voltage - V_{MPP} (V) | 34.9 | 35.1 | 35.2 | 35.4 | 35.6 |
| Maximum Power Current - I_{MPP} (A) | 13.98 | 14.01 | 14.05 | 14.10 | 14.16 |
| Open Circuit Voltage - V_{OC} (V) | 42.7 | 42.9 | 43.0 | 43.2 | 43.4 |
| Short Circuit Current - I_{SC} (A) | 14.75 | 14.79 | 14.83 | 14.87 | 14.91 |

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

| | |
|----------------------|--|
| Solar Cells | Monocrystalline |
| No. of cells | 132 cells |
| Module Dimensions | 2384×1303×33 mm (93.86×51.30×1.30 inches) |
| Weight | 38.3 kg (84.4 lb) |
| Front Glass | 2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant material | POE/EVA |
| Back Glass | 2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass) |
| Frame | 33mm(1.30 inches) Anodized Aluminium Alloy |
| J-Box | IP 68 rated |
| Cables | Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized |
| Connector | MC4 EV02 / TS4* |

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

| | |
|---|-------------|
| NOCT (Nominal Operating Cell Temperature) | 43°C (±2°C) |
| Temperature Coefficient of P_{MAX} | -0.34%/°C |
| Temperature Coefficient of V_{OC} | -0.25%/°C |
| Temperature Coefficient of I_{SC} | 0.04%/°C |

MAXIMUM RATINGS

| | |
|-------------------------|---------------------------------|
| Operational Temperature | -40 ~ +85°C |
| Maximum System Voltage | 1500V DC (IEC) 1500V DC (UL) |
| Max Series Fuse Rating | 35A |

WARRANTY

12 year Product Workmanship Warranty
 30 year Power Warranty
 2% first year degradation
 0.45% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 33 pieces
 Modules per 40' container: 594 pieces